

## CLAIMS

I/We claim:

- [c1]            1.     A method in a computer system for performing an inter-thread long jump, the method comprising:
  - receiving an indication of a set jump location;
  - determining whether a set jump thread that set the set jump location is the same thread that is currently executing; and
  - when the set jump thread is not the same thread that is currently executing, setting a state of the set jump thread to execute a long jump indicating the set jump location.
- [c2]            2.     The method of claim 1 wherein the setting of the state includes setting a program counter of the set jump thread to point to a long jump routine.
- [c3]            3.     The method of claim 1 wherein when the set jump thread is blocked on an operating system call, aborting the operating system call.
- [c4]            4.     The method of claim 3 including starting the execution of the set jump thread.
- [c5]            5.     The method of claim 1 wherein when the set jump thread is running, notifying the set jump thread of the inter-thread long jump.
- [c6]            6.     The method of claim 1 wherein when the set jump thread is running, directing the set jump thread to enter a known state prior to setting the state of the set jump thread.
- [c7]            7.     The method of claim 6 wherein the known state is a quiescent state.

- [c8]            8.     The method of claim 1 including determining whether the set jump thread still exists.
- [c9]            9.     The method of claim 1 wherein the computer system supports multiple streams.
- [c10]           10.    A system for performing an inter-thread long jump, the system comprising:  
                 a component that determines whether a set jump thread that set a set jump location is the same thread that is currently executing; and  
                 a component that, when the set jump thread is not the same thread that is currently executing, sets a state of the set jump thread to transfer control to the set jump location.
- [c11]           11.    The system of claim 10 wherein the setting of the state includes setting a program counter of the set jump thread to point to a long jump routine.
- [c12]           12.    The system of claim 10 wherein when the set jump thread is blocked on an operating system call, aborting the operating system call.
- [c13]           13.    The system of claim 12 including a component that starts execution of the set jump thread.
- [c14]           14.    The system of claim 10 wherein when the set jump thread is running, notifying the set jump thread of the inter-thread long jump.
- [c15]           15.    The system of claim 10 wherein when the set jump thread is running, directing the set jump thread to enter a known state prior to setting the state of the set jump thread.
- [c16]           16.    The system of claim 15 wherein the known state is a quiescent state.

- [c17]            17.    The system of claim 10 including determining whether the set jump thread still exists.
- [c18]            18.    The system of claim 10 wherein multiple streams are supported.
- [c19]            19.    A method in a computer system for performing an inter-thread long jump, the method comprising:
- under control of a set jump function, storing a current stream state, the current stream state including a return address; and
  - under control of a long jump function, when the long jump function is invoked by a thread that is different from a thread that invoked the set jump function,
    - locating state information for the thread that invoked the set jump function in the restored stream state;
    - setting a program counter in the located state information to point to an instruction that invokes the long jump function; and
    - under control of the thread that invoked the set jump function, performing a long jump by executing the instruction pointed to by the program counter wherein the long jump function
      - deallocates memory allocated since the set jump function was invoked;
      - restores the stored stream state; and
      - jumps to the return address included in the restored stream state.
- [c20]            20.    The method of claim 19 wherein the current stream state is stored in a set jump buffer.

- [c21]            21.    The method of claim 20 wherein the restoring includes retrieving the stored stream state from the set jump buffer.
- [c22]            22.    A method in a long jump thread of a computer system for performing an inter-thread long jump to a location in a set jump thread, the method comprising:
- receiving information relating to the set jump thread;
  - retrieving a thread identifier for the set jump thread from the received information;
  - retrieving a thread control block for the set jump thread based on the retrieved thread identifier;
  - determining from the retrieved thread control block a state of the set jump thread; and
  - causing, based on the determined state, the set jump thread to execute at a set jump location.
- [c23]            23.    The method of claim 22 wherein the state of the thread is blocked, resumable, running, or transition.
- [c24]            24.    The method of claim 23 wherein the thread state is blocked when the thread is blocked on a synchronization timeout.
- [c25]            25.    The method of claim 23 wherein the thread state is resumable when the thread is ready and waiting to be allocated to a stream.
- [c26]            26.    The method of claim 23 wherein the thread state is running when the thread is executing and is not blocked.
- [c27]            27.    The method of claim 23 wherein the thread state is transition when the thread is being allocated a stream.

- [c28]            28.    The method of claim 23 wherein the modifying includes setting a program counter in the thread control block to an address of a long jump routine.
- [c29]            29.    The method of claim 28 including putting the thread control block on a list of unblocked threads.
- [c30]            30.    The method of claim 28 including invoking the long jump routine when the thread starts running.
- [c31]            31.    The method of claim 23 further comprising:  
when the thread state is blocked,  
                 removing the thread from a blocked list;  
                 setting the thread state to resumable; and  
when the thread is blocked on an operating system call,  
                 aborting the operating system call.
- [c32]            32.    The method of claim 23 further comprising:  
when the thread state is running,  
                 when the thread is blocked on an operating system call,  
                                 aborting the operating system call;  
                 when the thread is handling a data blocked exception,  
                                 saving state information;  
                 creating a save area data structure;  
                 initializing the created save area data structure; and  
                 setting a program counter in the initialized data structure to an address of a long jump routine.
- [c33]            33.    A system for causing a long jump thread to cause a set jump thread to start executing at a location specified by the set jump thread, the system comprising:  
                 means for specifying a set jump location of the set jump thread; and

means for, under control of the long jump thread, causing the set jump thread to jump to the set jump location.